

## Isolated pancreatic tuberculosis mimicking pancreatic cancer: Case report

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**ABSTRACT**

Pancreatic tuberculosis is usually investigated as a mass or inflammation due to the lack of unique clinical or radiological characteristics; as a result, this rare extrapulmonary tuberculosis is usually diagnosed as pancreatic carcinoma. We present a 39-year-old female with pancreatic TB presenting as pancreatic carcinoma. The patient presented with abdominal pain in epigastric and right upper quadrant area for seven days with a previous contact of tuberculosis patient. She was jaundiced and tenderness on abdomen. Abdominal ultrasound revealed dilated common bile duct and computed tomography, and magnetic resonance cholangiopancreatography showed ill-defined mass at the medial aspect of the common bile duct involving pancreatic head. Endoscopic retrograde cholangiopancreatography also showed ill-defined lobulated lesion on pancreatic head. Biopsies revealed granulomatous inflammation and foci caseous necrosis confirming pancreatic tuberculosis. Patient was initiated on anti-TB treatment. Reporting rare cases help improve physician's abilities in identifying such specific illness which share common presentation clinically and radiographically.

**Keywords:** Radiological, Pancreatic cancer, Histopathology, Mass

**1. INTRODUCTION**

One of the primary causes of death from a single infectious agent and currently poses as the second leading cause of death globally is Mycobacterium tuberculosis infection (TB) second to severe acute respiratory syndrome Coronavirus – 2 (SARS-CoV-2) (Corona Virus Disease, 2019) (COVID-19). An estimated of 10 million adults and 1.1 million children are infected with TB infection (Global tuberculosis report, WHO, 2021). Although pulmonary TB accounts for majority of the cases, extrapulmonary involvement occurs in one fifth of all TB cases record (Herchline et al., 2020). The intestines, gastro-duodenum, liver, biliary tract, spleen, and pancreas are some of the intra-abdominal organs that TB can infect (Global tuberculosis report, WHO, 2021).

There has been a substantial rise in the number of frequency of reports of pancreatic TB (Panic et al., 2020). This could be attributed to the advancement

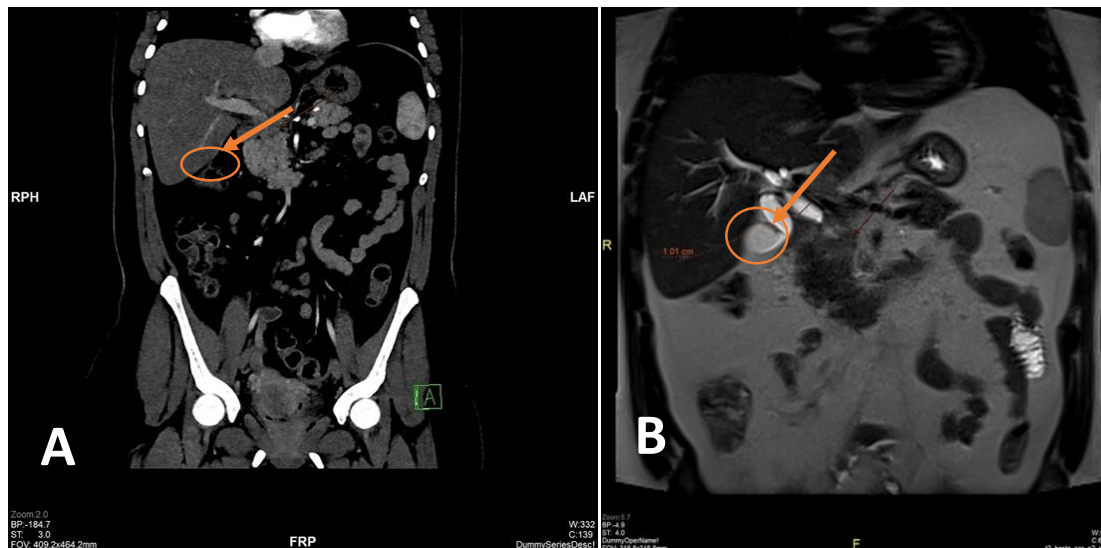
of new techniques and powerful imaging tools that enable the collection of pancreatic specimens. Another significant factor that contributes to the occurrence of increased number of reported cases of pancreatic TB is the rise in the population of immunocompromised individuals (Zhu et al., 2017). Pancreatic TB frequently mimics an unresectable malignant tumour clinically and radiologically, making it challenging to diagnose. Histopathological examination of tissue specimens obtained from surgical procedures is the standard technique of confirming the diagnoses (Sonthalia et al., 2013). Nevertheless, pre-operative detection of pancreatic abnormalities is currently achieved with the use of enhanced imaging techniques such as computed tomography (CT) and endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) and image-guided interventions (Panic et al., 2020).

We present a case report of a patient who underwent EUS-FNA with the pre-operative diagnosis of pancreatic carcinomas but later confirmed by histopathology of pancreatic TB. In this case report we also discuss the rare occurrence of pancreatic TB to emphasize the significance of comprehending rare diseases that exhibit symptoms and signs that are comparable to other more common diseases in the abdominal cavity.

## 2. CASE PRESENTATION

A 39 years old housewife known to have hypertension and dyslipidemia on Valsartan, Amlodipine and Fenofibrate. The patient presented to emergency room with abdominal pain since one week. The abdominal pain was mainly epigastric and right upper quadrant area which progressed gradually over the seven days. The pain was associated with yellowish discoloration of eyes, dark urine, and generalized pruritis. She had history of contact with TB patient (her father) when she was 14 years old. The findings of the clinical examination included jaundice and mild tenderness on the abdomen.

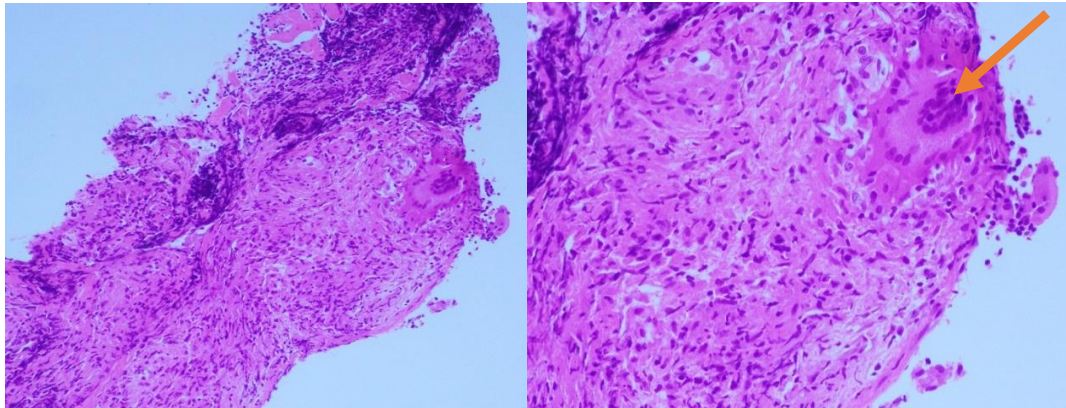
Abnormal laboratory tests were as follow, total bilirubin 64  $\mu\text{mol/L}$ , direct bilirubin 45  $\mu\text{mol/L}$ , serum glutamic oxaloacetic transaminase (SGOT) 144 U/L, serum glutamic pyruvic transaminase (SGPT) 202 U/L, lactic acid dehydrogenase (LDH) 354 U/L, alkaline phosphatase 213 U/L, and erythrocyte sedimentation rate (ESR) of 45. The abdominal ultrasound (US) showed a dilated common bile duct (CBD) of 9.1mm and mild intrahepatic ducts dilatation. After the patient admission, magnetic resonance cholangiopancreatography (MRCP) was done and revealed ill soft tissue mass lesion at the medial aspect of the CBD measuring 2.4 x 3.2 x 3.3 cm that was inseparable from the pancreatic head which resulted in mild biliary obstruction. The findings of the MRCP are shown in (Figure 1).



**Figure 1** A) CT scan of the abdomen showing the ill-defined lesion and dilated CBD. B) MRCP of the abdomen showing ill-defined mass at the mid aspect of the CBD inseparable from the pancreatic head (arrows), resulting in biliary duct dilation (circle).

According to the investigations done, neoplastic lesion and tuberculosis were suspected. While tumor markers CA and CEA were normal, the purified protein derivative (PPD) test showed positive results of 18 mm. The patient was referred to a higher center for endoscopic ultrasound (EUS) and endoscopic retrograde cholangiopancreatography (ERCP). The ERCP revealed a stricture at the mid CBD with proximal dilatation for which a sphincterotomy was done along with 8 cm x 10 mm fully covered metal stent to stop the bleeding. The EUS on the other hand showed a hypoechoic ill-defined lobulated lesion measuring 3 x 2.6 cm at the head on the pancreas. A total of six specimens were obtained from the lesion using 22 g fine needle aspiration and were sent for histopathology. After examining the samples, the report indicated a moderate acute or chronic granulomatous inflammation

with foci of caseous type necrosis and occasional multinucleated giant cell focally (Figure 2). The diagnosis made was pancreatic tuberculosis and patient was referred to the infectious diseases department to start the treatment. The patient started anti-TB regimen of Isoniazid, Rifampicin, Ethambutol HCL, Pyrazinamide and Pyridoxine.



**Figure 2** histopathological specimens showing granulomatous inflammation with tiny foci of caseous necrosis, multinucleated giant cell, and multiple lymphocytes infiltration with epithelioid cells.

### 3. DISCUSSION

Even in nations where TB infection is highly prevalent, pancreatic TB remains a rare condition. It is termed that the gastrointestinal tract is the sixth most predilection site for extrapulmonary tuberculosis, where reported incidence is higher in immunocompromised patients (Global tuberculosis report, WHO, 2021). Majority of the medical research papers on pancreatic TB Case reports and case series with the first study conducted by Harles in 1912 (Hammouda et al., 2020). Mycobacterium tuberculosis frequently spreads through deglutition or blood-borne infection to extrapulmonary organs including the gastrointestinal tract. Under such susceptible circumstances, the gastrointestinal system is exposed to TB infection commonly affecting the intestine, colon, and abdominal cavity (Zhu et al., 2017). For decades reported, the pancreas is one of the rarely affected organs by abdominal TB. Studies conducted by (Auerbach et al., 1994) and (Bhansali et al., 1977) documented pancreatic TB involvement in 4.7% and 0% of the patients respectively, in large autopsy series studies on TB patients.

Pancreatic TB presents a variety of clinical manifestations and most reported clinical features of this disease are non-specific and overlapping with other pancreatic abnormalities such as pancreatic cancer (Bhansali, 1977). According to Feng Xia et al pancreatic TB is commonly described with the following characteristics: i. mostly affects young people under the fifth decade of life, particularly female ii. Previous history of TB or previous contact history of TB or reside in an endemic zone of active TB iii. Frequently present with epigastric pain, fever and weight loss and iv. Diagnostic imaging studies indicate pancreatic mass and peripancreatic nodules may or may not have focal calcification (Xia et al., 2003). It is challenging to deduce a pre-operative, qualitative diagnosis of pancreatic TB. There are numerous factors that contribute to the misdiagnosis including low prevalence of pancreatic TB, absence of specific clinical manifestations and clinician's lack of relevant information. In addition, minimal clinical significance of routine laboratory and biochemical/immunological examination and difficulty in diagnosing pancreatic TB through imaging also contribute to misdiagnosis of pancreatic TB (Zhang et al., 2018). Results from histopathology, cytology and microbiology are ultimately used in determining the diagnosis of pancreatic TB.

Our patient information obtained from diagnostic imaging studies revealed the size of the soft tissue mass lesion present at the medial aspect of CBD inseparable from the pancreatic head and nature of lesion. However, the likelihood of malignant tumour was highly suspected and emphasized. In addition, the most common symptoms of pancreatic TB and pancreatic neoplasm are similar including abdominal pain, jaundice, weight loss and pancreatic mass. All these symptoms were noted in our patient, thus, emphasizing on the attributions of pancreatic tumour. Multiple case reports likewise report the pancreatic neoplasm as a differential diagnosis before confirming pancreatic TB through histopathology investigations (Zhu et al., 201; Hammouda et al., 2020; Rehman et al., 2019; Zhang et al., 2018; Cuadrado et al., 2017). An isolated pancreatic cancer is rare which can lead to misdiagnosis (Weiss et al., 2005). In addition, misdiagnosis of pancreatic neoplasm is due to the abdominal organs displayed in the imaging modalities which have similar density and are overlapped which may hinder indications that could suggest an abnormality (Zhu et al., 2017). A comparison based on our presented case was done after the literature review to compare the exposure, symptoms, site of the lesion and methods of diagnosis. Five similar studies were included for this matter; (Table 1).

**Table 1** Comparing characteristics of similar patient case reports

Author	Study Patient	(Abbas Zadeh et al., 2017)	(Hammouda et al., 2020)	(Taher et al., 2007)	(Rong et al., 2008)	(Flores et al., 2021)
Age of patient	35-year-old	23-year-old	36-year-old	51-year-old	60-year-old	70-year-old
Gender	Female	Female	Female	Female	Female	Female
Comorbidities	Hypertension	None	None	None	Treatment on steroids	HIV positive
Exposure to TB	Previous exposure to TB 21 years ago	None	None	None	None	None
Symptoms	Abdominal pain (epigastric and right upper quadrant area) for one week; jaundice, generalised purities	Epigastric pain and weight loss for two months	Epigastric abdominal pain, night sweats and weight loss for three months	Epigastric pains, fever, anorexia and weight loss for two months	Vague upper abdominal pain for one week	Anorexia and weight loss for two months
Site of lesion	Ill-defined lobulated lesion on head of pancreas	Solid-cystic mass in head of pancreas with extension into hilum of liver	Heterogenous lesion from pancreatic body	Heterogenous mass on head of pancreas and necrosis in head and body of pancreas and peripancreatic lymph nodes	Mass on pancreatic tail with sporadic metastasizes in spleen	Fistula with purulent drainage in duodenal bulb with invading mass from neck of the pancreas
Method of confirming diagnosis	Histopathology	Exploratory laparotomy and histopathology	Tuberculosis skin and histopathology	Histopathology	Histopathology	Acid Fast Bacilli positive and histopathology

Our patient was referred for endoscopic ultrasound for further evaluation of mass and lesions were determined at the CBD and head of the pancreas. Findings reported in our patient showed an ill-defined lobulated lesion was identified at the head of the pancreas. Studies conducted suggest ultrasonography for pancreatic TB frequently shows focal hypoechoic lesions or cystic lesions (Panic et al., 2020). It is reported that pancreatic mass presents as single tissue in 62.5% of cases with a heterogenous appearance. Pancreatic masses are commonly found in the pancreatic head in 56% of cases and associated with peripancreatic lymphadenopathy in 75% of cases (Hammouda et al., 2020; Weiss et al., 2005). Histopathological confirmation is indispensable for confirming the ultimate diagnosis of pancreatic TB. A granulomatous inflammation with signs of necrosis is the pathological hallmark of tuberculosis. The most prevalent condition that leads to development of caseous granulomas is caused by Mycobacterium tuberculosis. It is described that typical epithelioid and giganto-cellular granuloma is present in 60% of cases with caseous necrosis rarely identified (Veerabadran et al., 2007; Yang et al., 2014). Our patient reports indicated moderate acute or chronic granulomatous inflammation of foci caseous necrosis and multinucleated giant cell focally.

Anti-tuberculosis regimen treatment should be initiated once the diagnosis has been established for six to 12 months. Our patient was administered Isoniazid, Rifampicin, Ethambutol HCL and Pyrazinamide for the intensive phase of TB treatment for two months. The recommended regimen following the intensive phase is the continuation phase of Rifampicin and Isoniazid for at least four months (Global tuberculosis report, WHO, 2021). The response to treatment is usually predictable and reveals complete clinical and radiological improvement. The longer duration of treatment is prescribed for re-exposure or antimicrobial resistant TB which additionally require different classes of drugs (WHO consolidated guidelines on tuberculosis, 2020; Chaudhary et al., 2015).

#### 4. CONCLUSION

Diagnosing pancreatic TB requires a high degree of suspicion due to the rare nature of the disease. Usual clinical manifestations and imaging findings of a pancreatic mass may be indicative of cancer which would necessitate different therapeutic approaches and prognostic implications. Pancreatic TB which has been shown to mimic pancreatic carcinoma should also be investigated and



analysed for patients who come with pancreatic mass, particularly in immunocompromised individuals. Therefore, vigorous efforts should be performed to obtain pre-operative microbiological and histopathological diagnosis to avoid unnecessary surgical procedures. Reporting rare cases help raise awareness and increase physician's abilities in identifying such specific illness which share common presentation clinically and radiographically. Thus, it would be recommended to investigate for pancreatic TB in patients presenting with similar features, symptoms, and signs as the patient reported.

### Acknowledgement

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### Authors' contributions

Dr. Aljoaid has collected the first draft, Dr. Khan has prepared the laboratory and radiological reports, Dr. Shahin has prepared the manuscript and Dr. Barnawi searched the literature for similar articles. All the authors have reviewed and approved the final version of the manuscript.

### Informed consent

Written & oral informed consent was obtained from the patient.

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### Conflict of interest

The authors declare that there is no conflict of interests

### Data and materials availability

All data associated with this study are present in the paper.

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